

**Amendment and Response**

Applicant: Daniel R. Tretter et al.

Serial No.: 10/696,888

Filed: October 30, 2003

Docket No.: 200314885-1 / H304.125.101

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES ON DIFFERENT TYPES OF GRIDS

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**REMARKS**

This is responsive to the Non-Final Office Action mailed October 31, 2006. In that Office Action, the drawings were objected to as failing to comply with 37 C.F.R. §1.84(p)(5) because they included reference numbers that were not mentioned in the specification. The Examiner also objected to the specification at page 1, lines 19 and 22 and page 30, line 6. Claims 3, 5, 12, 14, 19, 21, 23, and 24 were objected due to minor informalities.

Further, the Examiner rejected claims 19-30 under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Claims 1 and 10 were rejected under 35 U.S.C. §102(e) as being anticipated by Gibbon et al., U.S. Publication No. 2003/0020809 (“Gibbon”). Claims 6, 7, 15, 16, 19, 24, 27, 30, 31, 34, 37, and 40 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon in view of Park, “Super-Resolution Image Construction: A Technical Overview”, IEEE Signal Processing Magazine; Vol. 20, pp. 21-36; May 2003 (“Park”). Claims 8, 9, 17, 18, 25, 26, 35, 36, 41, and 42 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon as modified by Park as applied to claims 7, 16, 24, 34, and 40 respectively above, and further in view of Nomura et al., U.S. Patent No. 6,990,249 (“Nomura”) and Tanaka et al., Japanese Patent No. 54136135A (“Tanaka”). Claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon as modified by Park as applied to claims 1, 10, 19, 27, 31, and 37 above, and further in view of Messing et al., U.S. Patent No. 6,466,618 (“Messing”).

With this Response, claims 1, 3, 5, 10, 12, 14, 19, 21, 23, 24, 27, 31, and 37 have been amended. Claims 1-42 remain pending in the application and are presented for reconsideration and allowance.

**Objection to Drawings**

The drawings were objected to as failing to comply with 37 C.F.R. §1.84(p)(5) because they included reference numbers that were not mentioned in the specification. Applicant has submitted herewith another set of drawings with replacement sheets for Figures 10, 11, and 23. In the replacement sheet for Figure 10, the appearance of the reference number “30I” has been changed to clarify that the reference number is “30I” rather than

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“301”. In the replacement sheet for Figure 11, the reference number “800” has been removed. In the replacement sheet for Figure 23, the reference number “1530” has been removed. Applicant respectfully requests removal of the objection to the drawings, and acceptance of the currently submitted set of drawings.

**Objection to Specification**

The Examiner objected to the specification at page 1, lines 19 and 22 and page 30, line 6. Applicant has amended the specification as indicated above based on the Examiner’s comments. Applicant respectfully requests removal of the objections to the specification.

**Claim Objections**

Claims 3, 5, 12, 14, 19, 21, 23, and 24 were objected due to minor informalities. Applicant has amended these claims as indicated above in accordance with the Examiner’s comments. Applicant did not make the change to claim 19, line 5, which was suggested by the Examiner, as the change would appear to create an antecedent basis issue. Applicant respectfully requests removal of the objection to claims 3, 5, 12, 14, 19, 21, 23, and 24.

**35 U.S.C. §101 Rejections**

The Examiner rejected claims 19-30 under 35 U.S.C. §101, indicating that the claimed invention is directed to a non-statutory subject matter. Applicant has amended independent claims 19 and 27 as indicated above, to positively recite language from the preamble as suggested by the Examiner. Applicant respectfully requests removal of the rejection of claims 19-30 under 35 U.S.C. §101.

**35 U.S.C. §102 Rejections**

Claims 1 and 10 were rejected under 35 U.S.C. §102(e) as being anticipated by Gibbon et al., U.S. Publication No. 2003/0020809 (“Gibbon”). Amended independent claim 1 recites “receiving image data for the image on a first type of grid”, “generating a first sub-frame and a second sub-frame corresponding to the image data, the first and the second sub-frames each generated on a second type of grid that is different than the first type of grid,

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wherein one of the first type of grid and the second type of grid is a non-rectangular grid”, and “alternating between displaying the first sub-frame in a first position and displaying the second sub-frame in a second position spatially offset from the first position.”

Amended independent claim 10 recites “a buffer adapted to receive image data for the image on a first type of grid”, “an image processing unit configured to define first and second sub-frames corresponding to the image data, the first and the second sub-frames each defined on a second type of grid that is different than the first type of grid, wherein one of the first type of grid and the second type of grid is a non-rectangular grid”, and “a display device adapted to alternately display the first sub-frame in a first position and the second sub-frame in a second position spatially offset from the first position.”

There is no teaching or suggestion in Gibbon regarding receiving image data for an image on a first type of grid, and generating sub-frames corresponding to the image data on a second type of grid that is different than the first type of grid. Rather, Gibbon uses a rectangular grid for all images. (See, e.g., Gibbon at Figures 3-6 and corresponding description). The Examiner’s argument that “low resolution or in other words smaller grid size is considered to be a different grid” (Office Action at para. no. 8, page 6) ignores the language used in claims 1 and 10. These claims do not simply recite “a different grid”. Rather, they recite “a second type of grid that is different than the first type of grid”. Gibbon uses the same type of grid for all images. Gibbon also does not teach or suggest “wherein one of the first type of grid and the second type of grid is a non-rectangular grid”, as recited in claims 1 and 10.

In view of the above, Gibbon does not teach or suggest each and every limitation of independent claims 1 and 10. Applicant respectfully requests removal of the rejection of claims 1 and 10 under 35 U.S.C. §102(e), and requests allowance of these claims.

**35 U.S.C. §103 Rejections**

Claims 6, 7, 15, 16, 19, 24, 27, 30, 31, 34, 37, and 40 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon in view of Park, “Super-Resolution Image Construction: A Technical Overview”, IEEE Signal Processing Magazine; Vol. 20, pp. 21-36; May 2003 (“Park”).

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Since dependent claims 6, 7, 15, and 16 further limit patentably distinct claim 1 or claim 10, and are further distinguishable over the cited references, claims 6, 7, 15, and 16 are believed to be allowable over the cited references. Withdrawal of the rejection of claims 6, 7, 15, and 16 under 35 U.S.C. §103(a), and allowance of these claims, are respectfully requested.

Amended independent claim 19 recites “means for receiving a first high resolution image on a first type of grid”, and “means for generating a first plurality of low resolution sub-frames for display at spatially offset positions to generate the appearance of a high resolution image based on the first high resolution image and the stored relationship, each of the low resolution sub-frames generated on a second type of grid, wherein one of the first type of grid and the second type of grid is a non-rectangular grid.” There is no teaching or suggestion in Gibbon regarding receiving a high resolution image on a first type of grid, and generating sub-frames on a second type of grid. Rather, Gibbon uses a rectangular grid for all images. (See, e.g., Gibbon at Figures 3-6 and corresponding description). The Examiner’s argument that “low resolution or in other words smaller grid size is considered to be a different grid” (Office Action at para. no. 10, page 8) ignores the language used in claim 19. This claim does not simply recite “a different grid”. Rather, it recites “a first type of grid” and “a second type of grid”. Gibbon uses the same type of grid for all images. Gibbon also does not teach or suggest “wherein one of the first type of grid and the second type of grid is a non-rectangular grid”, as recited in claim 19. The Park publication also does not teach or suggest the above-quoted limitations of claim 19.

In view of the above, Gibbon and Park, either alone, or in combination, do not teach or suggest each and every limitation of independent claim 19. Applicant respectfully requests removal of the rejection of claim 19 under 35 U.S.C. §103(a), and requests allowance of this claim. Since dependent claim 24 further limits patentably distinct claim 19, and is further distinguishable over the cited references, claim 24 is believed to be allowable over the cited references. Withdrawal of the rejection of claim 24 under 35 U.S.C. §103(a), and allowance of this claim, is respectfully requested.

Amended independent claim 27 recites “receiving a first high resolution image on a first type of grid”, and “generating a first plurality of low resolution sub-frames for display at

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spatially offset positions to generate the appearance of a high resolution image based on the first high resolution image and the relationship between sub-frame values and high resolution image values, the first plurality of low resolution sub-frames generated on a second type of grid, wherein one of the first type of grid and the second type of grid is a non-rectangular grid.” There is no teaching or suggestion in Gibbon regarding receiving a high resolution image on a first type of grid, and generating sub-frames on a second type of grid. Rather, Gibbon uses a rectangular grid for all images. (See, e.g., Gibbon at Figures 3-6 and corresponding description). The Examiner’s argument that “low resolution or in other words smaller grid size is considered to be a different grid” (Office Action at para. no. 10, page 8) ignores the language used in claim 27. This claim does not simply recite “a different grid”. Rather, it recites “a first type of grid” and “a second type of grid”. Gibbon uses the same type of grid for all images. Gibbon also does not teach or suggest “wherein one of the first type of grid and the second type of grid is a non-rectangular grid”, as recited in claim 27. The Park publication also does not teach or suggest the above-quoted limitations of claim 27.

In view of the above, Gibbon and Park, either alone, or in combination, do not teach or suggest each and every limitation of independent claim 27. Applicant respectfully requests removal of the rejection of claim 27 under 35 U.S.C. §103(a), and requests allowance of this claim. Since dependent claim 30 further limits patentably distinct claim 27, and is further distinguishable over the cited references, claim 30 is believed to be allowable over the cited references. Withdrawal of the rejection of claim 30 under 35 U.S.C. §103(a), and allowance of this claim, is respectfully requested.

Amended independent claim 31 recites “receiving image data for the image on a first type of grid”, “generating a first frame corresponding to the image data based on minimization of an error between the image data and a simulated image, the first frame generated on a second type of grid that is different than the first type of grid”, and “displaying the first frame on the second type of grid, wherein one of the first type of grid and the second type of grid is a non-rectangular grid.” There is no teaching or suggestion in Gibbon regarding receiving image data on a first type of grid, and generating a frame on a second type of grid that is different than the first type of grid. Rather, Gibbon uses a rectangular grid for all images. (See, e.g., Gibbon at Figures 3-6 and corresponding description). The

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Examiner's argument that "low resolution or in other words smaller grid size is considered to be a different grid" (Office Action at para. no. 10, page 8) ignores the language used in claim 31. This claim does not simply recite "a different grid". Rather, it recites "a second type of grid that is different than the first type of grid". Gibbon uses the same type of grid for all images. Gibbon also does not teach or suggest "wherein one of the first type of grid and the second type of grid is a non-rectangular grid", as recited in claim 31. The Park publication also does not teach or suggest the above-quoted limitations of claim 31.

In view of the above, Gibbon and Park, either alone, or in combination, do not teach or suggest each and every limitation of independent claim 31. Applicant respectfully requests removal of the rejection of claim 31 under 35 U.S.C. §103(a), and requests allowance of this claim. Since dependent claim 34 further limits patentably distinct claim 31, and is further distinguishable over the cited references, claim 34 is believed to be allowable over the cited references. Withdrawal of the rejection of claim 34 under 35 U.S.C. §103(a), and allowance of this claim, is respectfully requested.

Amended independent claim 37 recites "a buffer adapted to receive image data for the image on a first type of grid", "an image processing unit configured to define a first frame corresponding to the image data based on minimization of an error between the image data and a simulated image, the first frame defined on a second type of grid that is different than the first type of grid, wherein one of the first type of grid and the second type of grid is a non-rectangular grid", and "a display device adapted to display the first frame on the second type of grid." There is no teaching or suggestion in Gibbon regarding receiving image data on a first type of grid, and generating a frame on a second type of grid that is different than the first type of grid. Rather, Gibbon uses a rectangular grid for all images. (See, e.g., Gibbon at Figures 3-6 and corresponding description). The Examiner's argument that "low resolution or in other words smaller grid size is considered to be a different grid" (Office Action at para. no. 10, page 8) ignores the language used in claim 37. This claim does not simply recite "a different grid". Rather, it recites "a second type of grid that is different than the first type of grid". Gibbon uses the same type of grid for all images. Gibbon also does not teach or suggest "wherein one of the first type of grid and the second type of grid is a non-rectangular

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grid”, as recited in claim 37. The Park publication also does not teach or suggest the above-quoted limitations of claim 37.

In view of the above, Gibbon and Park, either alone, or in combination, do not teach or suggest each and every limitation of independent claim 37. Applicant respectfully requests removal of the rejection of claim 37 under 35 U.S.C. §103(a), and requests allowance of this claim. Since dependent claim 40 further limits patentably distinct claim 37, and is further distinguishable over the cited references, claim 40 is believed to be allowable over the cited references. Withdrawal of the rejection of claim 40 under 35 U.S.C. §103(a), and allowance of this claim, is respectfully requested.

Claims 8, 9, 17, 18, 25, 26, 35, 36, 41, and 42 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon as modified by Park as applied to claims 7, 16, 24, 34, and 40 respectively above, and further in view of Nomura et al., U.S. Patent No. 6,990,249 (“Nomura”) and Tanaka et al., Japanese Patent No. 54136135A (“Tanaka”).

Since dependent claims 8, 9, 17, 18, 25, 26, 35, 36, 41, and 42 further limit patentably distinct claim 1, 10, 19, 31, or 37, and are further distinguishable over the cited references, claims 8, 9, 17, 18, 25, 26, 35, 36, 41, and 42 are believed to be allowable over the cited references. Withdrawal of the rejection of claims 8, 9, 17, 18, 25, 26, 35, 36, 41, and 42 under 35 U.S.C. §103(a), and allowance of these claims, are respectfully requested.

Claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gibbon as modified by Park as applied to claims 1, 10, 19, 27, 31, and 37 above, and further in view of Messing et al., U.S. Patent No. 6,466,618 (“Messing”). Since dependent claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 further limit patentably distinct claim 1, 10, 19, 27, 31, or 37, claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 are believed to be allowable over the cited references. Withdrawal of the rejection of claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 under 35 U.S.C. §103(a), and allowance of these claims, are respectfully requested.

Claims 2-5, 11-14, 20-23, 28, 29, 32, 33, 38, and 39 are also further distinguishable over the cited references. As one example, claim 2 recites “wherein the first type of grid is a rectangular grid and the second type of grid is a diamond grid.” Thus, since this claim further defines independent claim 1, the resulting claim recites receiving image data for the image on

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a rectangular grid, generating a first sub-frame and a second sub-frame corresponding to the image data on a diamond grid, and alternating between displaying the first sub-frame in a first position and displaying the second sub-frame in a second position spatially offset from the first position. As discussed above with respect to independent claim 1, Gibbon uses a rectangular grid for all images (See, e.g., Gibbon at Figures 3-6 and corresponding description). Gibbon does not teach or suggest receiving image data for an image on a rectangular grid, and generating a first sub-frame and a second sub-frame corresponding to the image data on a diamond grid.

Messing and Park also do not teach or suggest receiving image data for the image on a rectangular grid, and generating a first sub-frame and a second sub-frame corresponding to the image data on a diamond grid. Messing at col. 6, lines 23-35, which was cited by the Examiner (Office Action at para. no. 12, page 12), discloses a technique for extracting color images from a low resolution CCD sensor. The technique includes sampling the green color field 78 on a quincunx grid. (Messing at col. 6, line 28). This disclosure regarding sampling a single color field on a quincunx grid does not teach or suggest receiving image data for an image on a rectangular grid, and generating a first sub-frame and a second sub-frame corresponding to the image data on a diamond grid.

The Examiner also cited Messing at col. 7, lines 48-54 (Office Action at para. no. 12, page 12), which discusses the multi-frame resampler 150. The multi-frame resampler 150 resamples multiple low-resolution sampled frames 110 to generate a high resolution frame 154. (See, e.g., Messing at col. 6, lines 44-45, and col. 7, lines 32-34). This disclosure regarding resampling multiple low-resolution sampled frames to generate a high resolution frame does not teach or suggest receiving image data for an image on a rectangular grid, and generating a first sub-frame and a second sub-frame corresponding to the image data on a diamond grid.

There is also no suggestion to combine Gibbon and Messing. The Federal Circuit has stated “[i]n holding an invention obvious in view of a combination of references, there must be some suggestion, motivation, or teaching in the prior art that would have led a person of ordinary skill in the art to select the references and combine them in the way that would produce the claimed invention.” *Karsten Manufacturing Corp. vs. Cleveland Golf Co.*, 58

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U.S.P.Q.2d 1286, 1293 (CAFC 2001). Gibbon and Messing disclose very different types of systems. Gibbon discloses a projection system for the projection of low-resolution superimposed sub-images. (See, e.g., Gibbon at Abstract, and para. nos. 0030-0034). Messing discloses techniques for generating high-resolution printed copies of images from a low-resolution source, such as a digital camera or a video camera. (See, e.g., Messing at Abstract, and para. no. 1, lines 5-15). There is no teaching or suggestion in Messing regarding superimposed projection, or generating sub-images for superimposed projection. There is no teaching or suggestion in Messing that the techniques disclosed therein could or should be applied to a projection system that projects low-resolution superimposed sub-images, such as that disclosed in Gibbon.

**CONCLUSION**

In view of the above, Applicant respectfully submits that pending claims 1-42 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-42 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(h)(i). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 08-2025.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed to either Jeff A. Holmen at Telephone No. (612) 573-0178, Facsimile No. (612) 573-2005 or Denise L. Saffold at Telephone No. (650) 236-4868, Facsimile No. (650) 852-6063. In addition, all correspondence should continue to be directed to the following address:

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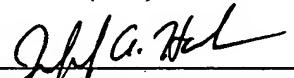
Respectfully submitted,

Daniel R. Tretter et al.

By their attorneys,

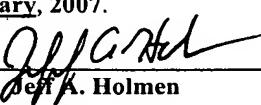
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**CERTIFICATE UNDER 37 C.F.R. 1.8:**

The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 24<sup>th</sup> day of January, 2007.

By:   
Name: Jeff A. Holmen